

PROTOCOL ISSUES

- Data sharing with ACE-Asia: protocol is in place for full data sharing
 - Add ACE-Asia data from joint flights to TRACE-P archive?
- Proposed fast track papers:
 - Vay/Avery, “Precision constraints on CO₂ measurements”
 - Mauldin/Eisele, “Nighttime aerosol nucleation in the MBL”
 - Any others?
- FGCMS instrument paper (Apel/Riemer) may have a better audience outside of JGR – should we release it from the protocol?

CURRENT DATA ARCHIVAL AND PUBLICATION SCHEDULE

Data Workshop #1; select scientific journal & conference for presentation	November 1, 2001
PIs submit final flight data to archive	December 1, 2001
Chemical Plots Blue Books to Science Team with final data; web based	January 15, 2001
Merge of final data available on Team ftp site	January 15, 2001
Final archive available on Public ftp site	February 8, 2002
Submit model products to archive	February 15, 2002
Results-oriented Workshop # 2	April 22, 2002
Preliminary Special Publication available to Science Team	April 22, 2002
Science Manuscripts to Journal	July, 10, 2002

- Can we meet the Dec 1 deadline for submission of final flight data?
- Where should we publish? (JGR special section OK?)
- How do people feel about the July 10 deadline for manuscripts?
- Should we plan for a second special section with deadline in 2003?
- Should we organize a special session at AGU? (spring, fall?)

INTERCONTINENTAL TRANSPORT EXPERIMENT – NORTH AMERICA (INTEX-NA)

Revised white paper, Nov 2001 (H.B. Singh, D.J. Jacob, L. Pfister)

OBJECTIVES:

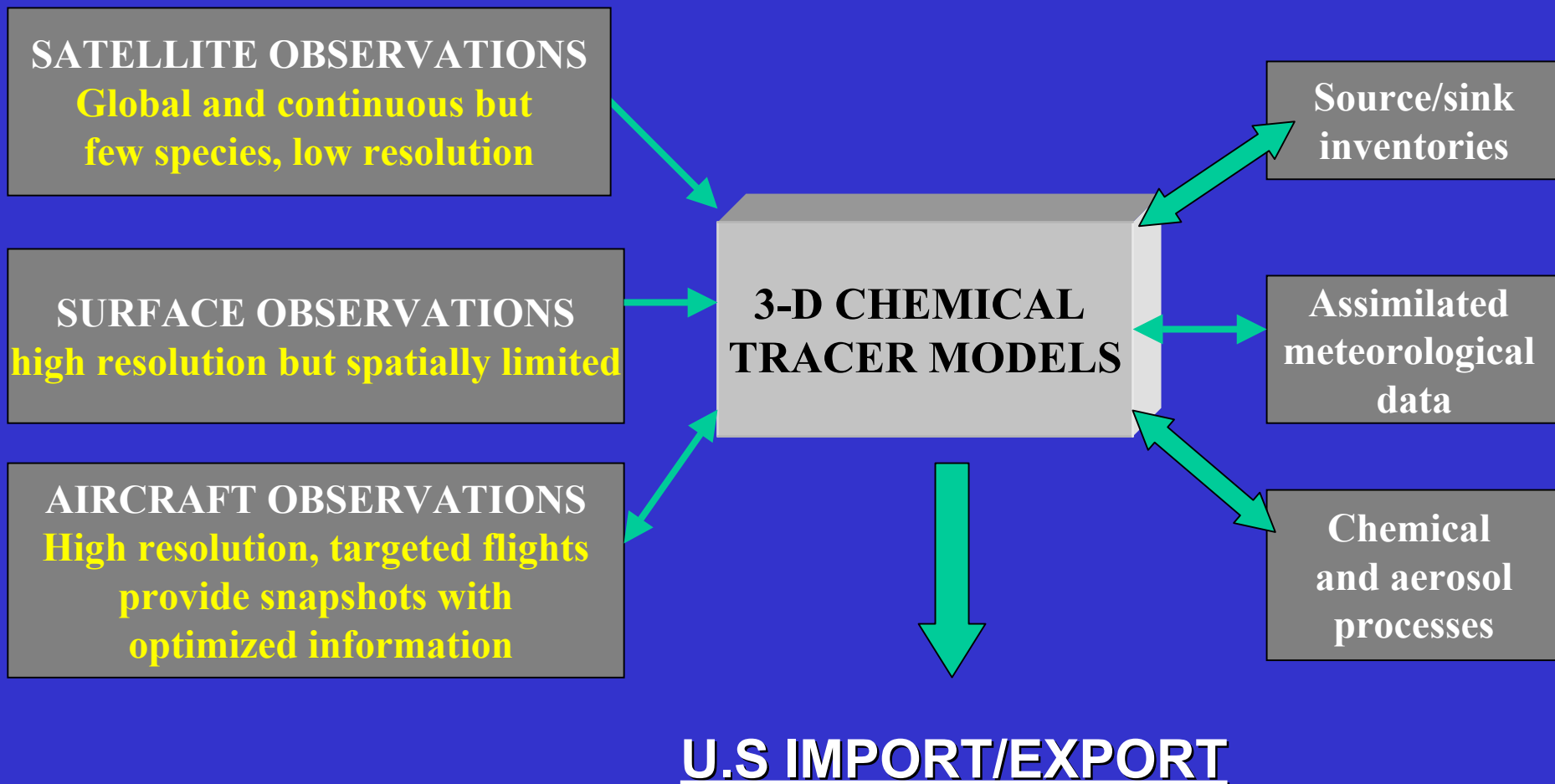
- To quantify the North American import and export of
(1) atmospheric oxidants and their precursors, (2) aerosols and their precursors, (3) long-lived greenhouse gases
- To relate this import/export to surface sources/sinks and to continental boundary layer chemistry

TWO AIRCRAFT: NASA DC-8 and P-3

TWO PHASES:

- **Summer 2004:**
 - active photochemistry, biosphere
 - aerosol radiative forcing
 - carbon uptake
- **Spring 2006:**
 - maximum Asian inflow
 - contrast with summer

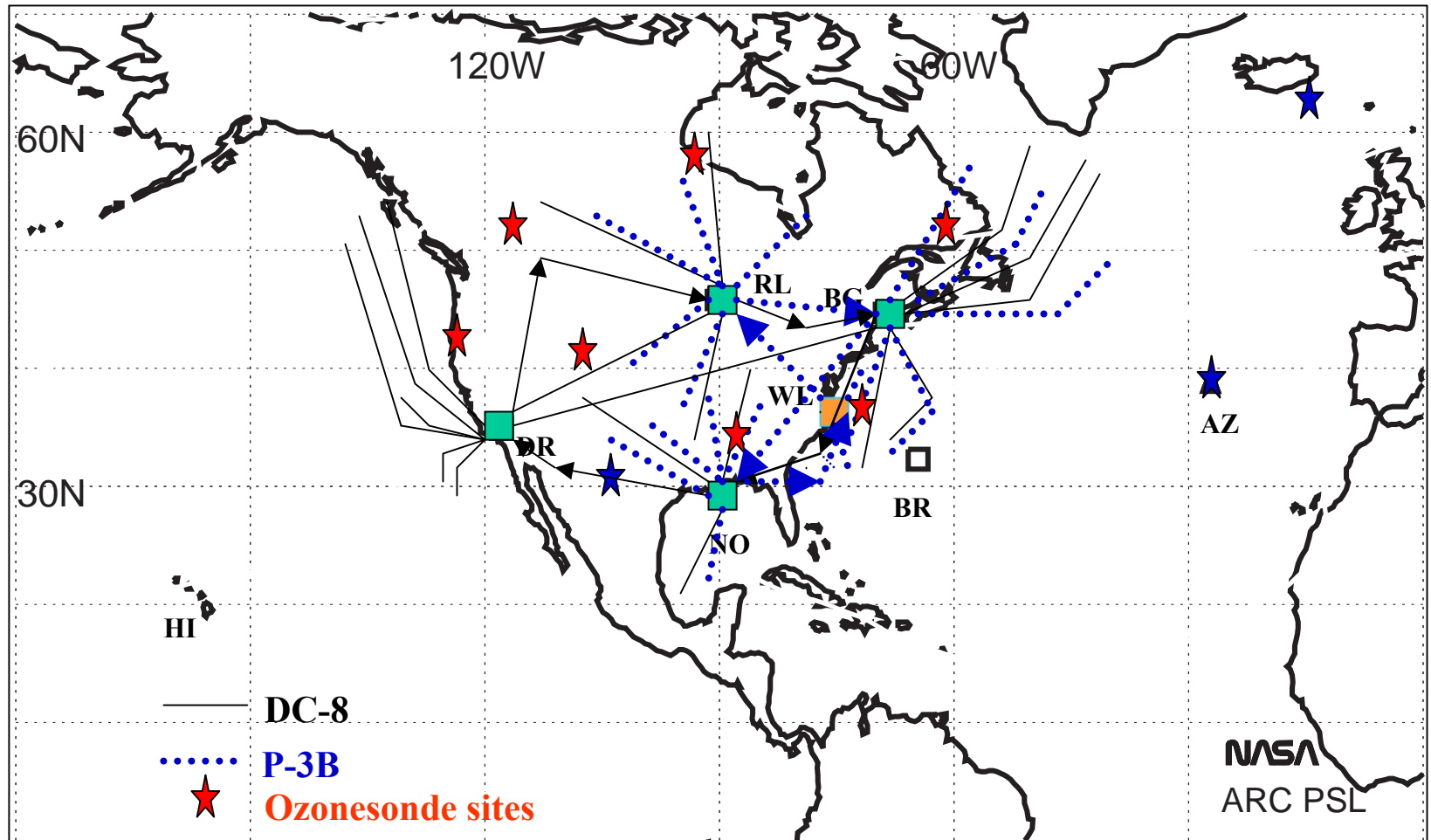
INTEGRATION OF AIRCRAFT OBSERVATIONS WITH SATELLITE DATA AND MODEL INFORMATION IS CRITICAL TO THE OBJECTIVES OF INTEX-NA



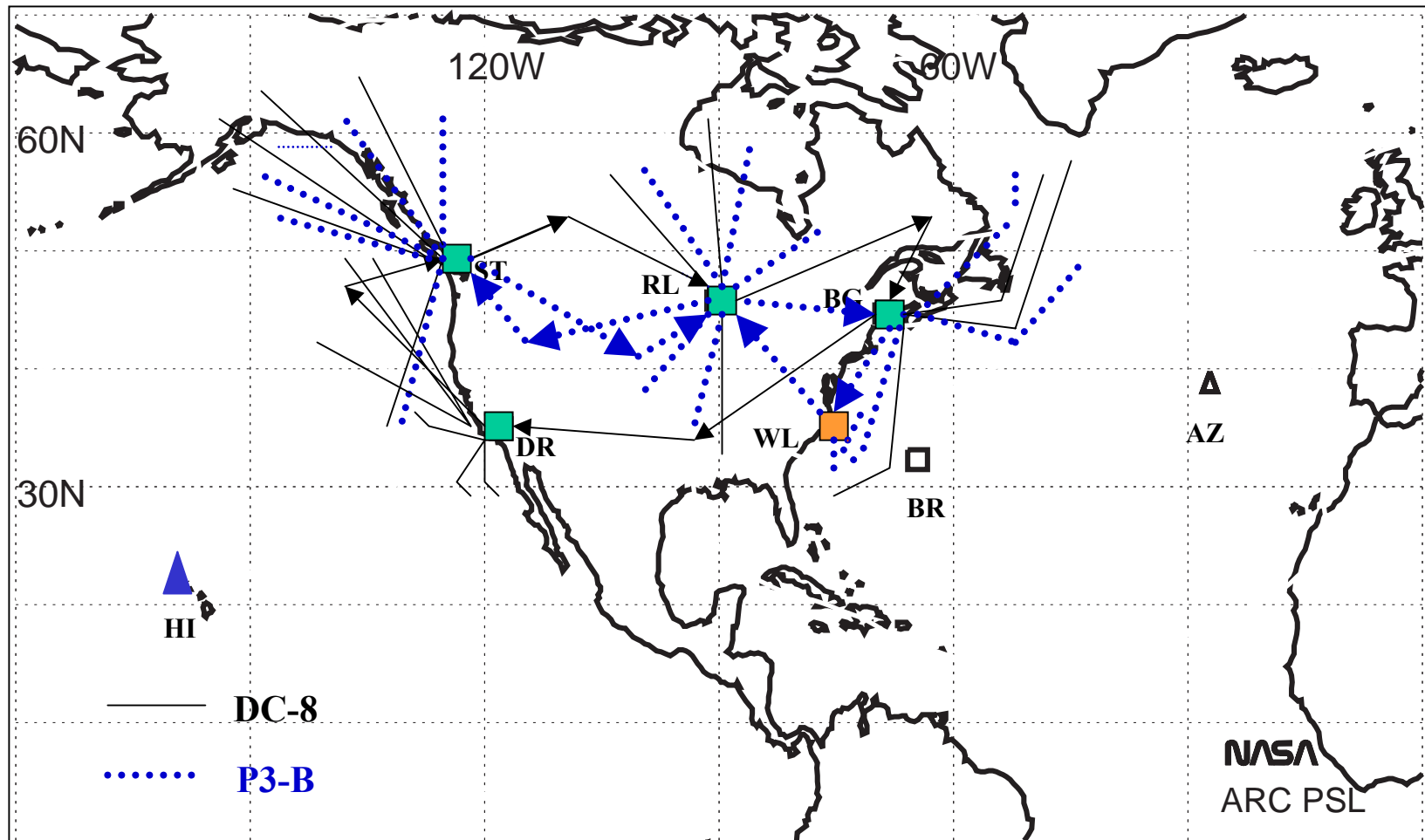
INTEX-NA FLIGHT TYPES

- N American outflow to Atlantic (DC-8, P-3)
 - Follow TRACE-P model
- N American inflow from Pacific (DC-8)
 - Curtains parallel to coast
- Transcontinental flights (DC-8)
 - Curtains to define transcontinental gradients, inflow/outflow pathways
- Continental boundary layer mapping (P-3)
 - Relate gradients to sources, processing
- Continental boundary layer – free troposphere exchange (P-3, DC-8)
 - Determine outflow mechanisms, fluxes
- Satellite validation (DC-8)
 - Expand on TRACE-P model

INTEX NOMINAL FLIGHT TRACKS FOR PHASE A (SUMMER)



INTEX NOMINAL FLIGHT TRACKS FOR PHASE B (SPRING)



INTEX-NA HAS LINKAGES WITH A NUMBER OF ATMOSPHERIC PROGRAMS

- **In situ**

- North American Carbon Program (2002-)
- NOAA Northeast U.S. Study (2004)
- European UT/LS program (-2005)
- Asian APARE program (ongoing)

- **Satellites**

- Terra [MOPITT] (1999-)
- Envisat [SCIAMACHY, MIPAS] (2002-)
- NMP/GIFTS (2003-)
- Aura [TES, OMI, HRDLS, TES] (2004-)
- ESSP/OCO (2004-) (?)

- **Modeling**

- EPA OAQPS/ORD climate change/air quality initiative (2001-2010)

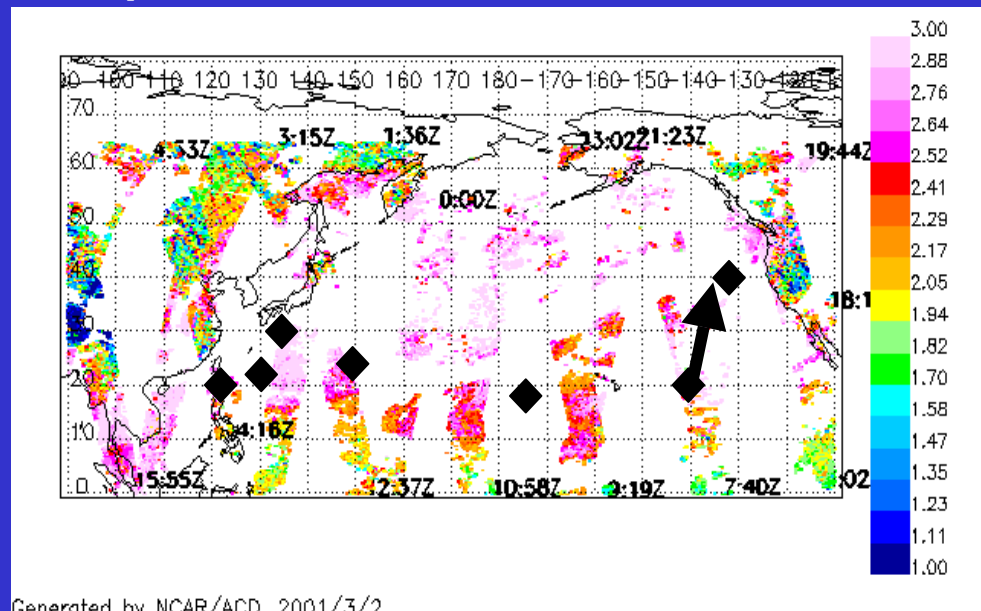
AURA

TROPOSPHERIC CHEMISTRY MEASUREMENTS FROM SATELLITES

Sensor	TOMS/ TRIANA	AVHRR/ SEAWIFS	GOME	MOPITT	MODIS	SCIA MACHY	MIPAS	SAGE III	TES	HRDLS	OMI	MLS
Launch	1979		1995	1999	1999	2002	2002	2003	2004	2004	2004	2004
O ₃	col		col			col/limb	limb	limb	radi/limb	limb	col	limb
H ₂ O	col					col/limb	limb	limb	radi/limb	limb		limb
CO				radi		col/limb	limb		radi/limb			limb
NO									limb			
NO ₂			col			col/limb					col	
HNO ₃							limb		limb	limb		
CH ₄				col		col/limb			col	limb		
CH ₂ O			col			col/limb					col	
SO ₂						col			col		col	
CO ₂						col/limb						
BrO			col			col					col	
HCN												limb
Aerosol	col	col			col	col/limb		limb		limb	col	

SATELLITE VALIDATION DURING TRACE-P (MOPITT)

- **MOPITT orbit track was an important factor in day-to-day flight planning;**
~50% of flights had good opportunities for validation
 - orbit track, timing, clouds had to be consistent with science goals
 - large orbit swath, similarity of pixel w/ DC-8 spiral radius was an advantage
- **Large range of vertical structures were sampled**
 - this is easily achieved in a GTE-type mission
- **Unavoidable time mismatch between satellite and aircraft was shown to be a non-issue**
 - tropospheric structures are persistent on scales < 1 hour

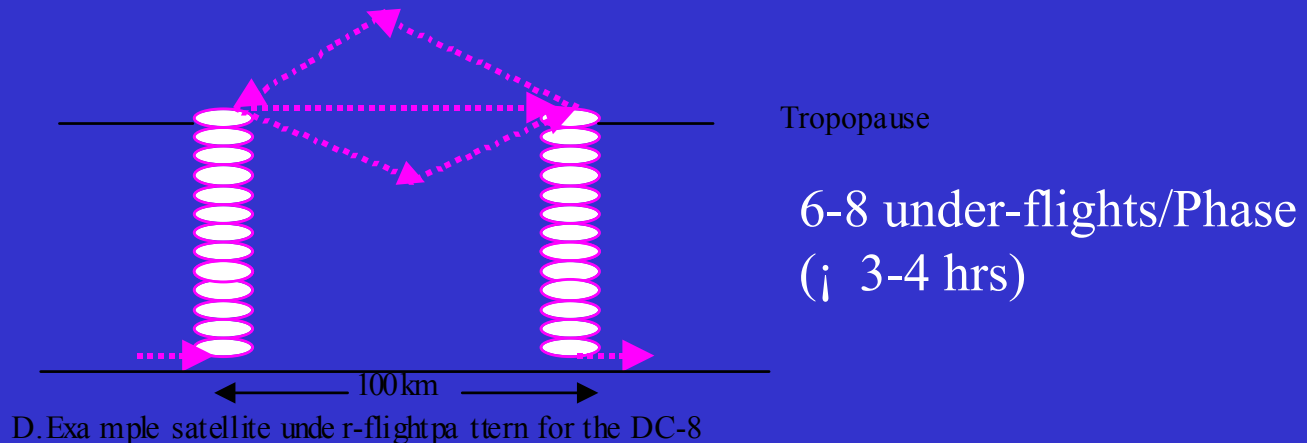


◆ MOPITT validation spirals

→ MOPITT validation transect (following orbit track)

SATELLITE VALIDATION DURING INTEX-NA WILL BE MORE COMPLEX AND REQUIRE MORE HOURS

- More satellite instruments with different fields of view, limb+nadir sounding
- Two spirals along orbit track joined by high-altitude transect may provide the right model



- INTEX-NA should be part of a satellite validation strategy but it can't do it all

WHY DOES INTEX-NA NEED TO GO IN 2004?

To maintain the momentum of GTE,
a key program in tropospheric chemistry research

- **Who says we need a mission every three years?**
 - This interval (2001-2004) is already longer than it has ever been for GTE. Such a delay is justified to exploit the richness of the TRACE-P data set and to set aside time for instrument development and intercomparison, but a longer delay would break GTE momentum.
- **What about the money?**
 - INTEX *per se* is not the issue – deployment is a small fraction of the cost of the NASA tropospheric chemistry program, and deployment in the U.S. will be relatively inexpensive.
- **What about Aura validation needs?**
 - They can be addressed in INTEX-NA (B). INTEX-NA (A) will meet other satellite validation needs.
- **What about linkages with other aircraft programs?**
 - NOAA/Northeast *will* take place in 2004. Timelines of other programs are not well defined at this stage and will depend in part on INTEX timing.

A SUMMARY OF OUR PROBLEMS

- There is no appointed Tropospheric Chemistry Program manager and NASA HQ shows no hurry to make such an appointment in the near future
 - We need to lobby – begin with letter to Ghassem Asrar?
- The program managers at HQ pledge support for the tropospheric chemistry program; but without a program manager we need to be concerned about post-TRACE-P funding
 - We need to find people interested in the job – anyone in this room?
- The future of GTE hinges on its integration with the satellite program, both for scientific objectives and for validation (\$\$\$); but the tropospheric chemistry community is viewed by HQ as indifferent to the satellite program
 - We need to think more about satellite observations, beginning with TRACE-P, and be active in design of the Aura validation plan.
- The Aura validation team doesn't think GTE missions can meet (all) their needs
 - Focus on the role GTE missions can play (science-based validation), get involved in meeting complementary needs (e.g., tropical mini-missions)
- It is critical to the momentum of GTE to have a science mission in 2004 even without Aura – but not everyone at HQ is convinced
 - Produce exciting TRACE-P science, coordinate with NACP, do INTEx Phase B (spring) first, make it a “pre-Aura”.